

Verifying data for the implementation of the water release module of the WAS program

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Abstract

The Water Administration System (WAS) is designed to be a management tool for irrigation schemes and water control offices that want to manage their water accounts and supply water to clients through canal networks, pipelines and rivers. The ultimate aim of WAS is to optimise irrigation water management and minimise management-related distribution losses in irrigation canals. This research projects focused on the implementation of the water release module of the WAS program at the Vaalharts irrigation scheme. The WAS consists of four modules that are integrated into a single program that can be used on a single PC or a multi-user environment. The four modules are an administration module, a water release module, water accounts module and a water request module. The first three modules are already implemented at Vaalharts, while module four is implemented only partially. This module links with the water request module and calculated water releases for the main canal and all its branches allowing for lag times and any water losses and accruals. To precisely calculate this water release, accurate data is needed to ensure that the correct volume of water is released into the canal network. This can be done by verifying existing data with field data. To optimise the management of the irrigation scheme the fully implemented WAS program need to be installed and running at the scheme. A series of data and calculation verifications need to be executed. The exercise will show the adequacy and correctness of the available database WAS uses to do the release calculation from. This will ensure improved management of the irrigation scheme, catchment and water resource sustainability. It is planned that the information generated from this project will be used in the compilation of integrated catchment management information system, currently underway at the Central university of Technology, Free State, South Africa. It is for this reason that all data should be verified, as trustworthy results and service through management can then be offered to the community and irrigation area.

Keywords: water administration, irrigation, water distribution, canal network, water utilisation, agricultural, reach distances, lag time, discharge, water, demand management

Introduction

The slogan of the Israeli Water Directorate which states that ‘...no man may waste a single drop of water that another man may turn into bread...’ could be applied to the current situation in South Africa. In general, South Africa is considered a water-scarce country (Ayoda, 1988). Water restrictions and the scarcity of water in South Africa have taught us to use water sparingly from an early age. The National Water Act, Act 36 of 1998 (South Africa, 1998a) also emphasises this issue of water usage and constantly refers to conservation control and equitable distribution of water (South Africa, 1998b). Conferences, symposiums and workshops therefore play a vital role in defining and planning sustainable resource management (Cousens, 1998). Water resources need to be controlled by a well-organised managerial body, which will form the basis for effective distribution of the resource.

According to Görgens et al. (1998) water resource management in South Africa has been transformed significantly as a result of the following two events:

- The democratisation of the Republic of South Africa
- The need for new approaches to water resource management due to misuse and mismanagement of available water resources.

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Simplifying the management process is important, as it could be a lengthy and difficult program. Supplying the controlling body with a management tool will increase the degree of conservation, control, distribution and efficiency of water resource use. The Water Administration System (WAS) has been implemented at the Vaalharts Waters User’s Association (VHWUA) in order to manage water resources effectively. The WAS is designed as a management tool for irrigation schemes and water management offices to manage their accounts and to supply water to clients through canal networks, pipelines and rivers (Benadé, 2001). The WAS consists of four modules that are integrated into a single program that can be used on a single PC or a multi-user environment. The PC network system is currently in use at the VHWUA. The four modules can be implemented partially or as a whole, depending on the requirements of the specific scheme or office. The four modules are:

- An administration module
- A water request module
- A water accounts module
- A water release module.

The first three modules have been fully implemented at Vaalharts, while the water release module has been partially implemented. This module links with the water administration and water request modules and calculates water releases for the main canal and all its branches, allowing for lag times, water losses and accruals. The four modules can be implemented partially or as a whole, depending on the requirements of the specific